s18QUIZ: EXP LOG (SLTN v275)
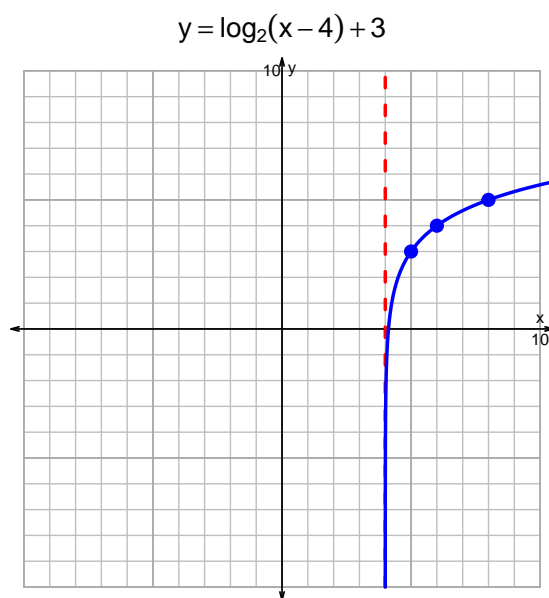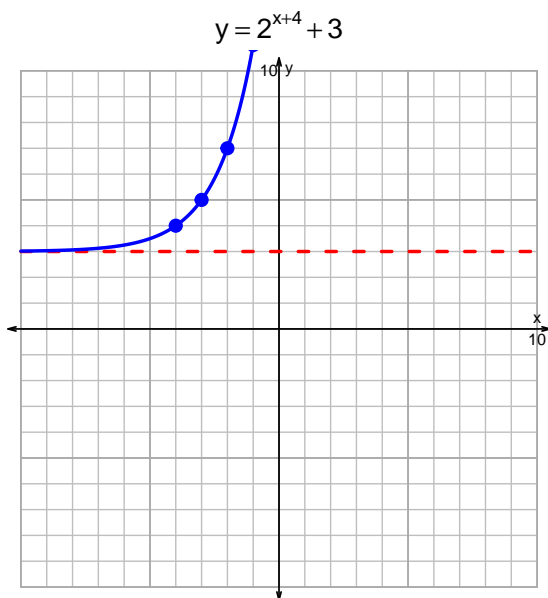
1. Graph $y = 2^{x+4} + 3$ and $y = \log_2(x-4) + 3$ on the grids below. Also, draw any asymptotes with dotted lines.

$$y = 2^{x+4} + 3$$

$$y = \log_2(x-4) + 3$$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-29 = \left(\frac{-7}{3}\right) \cdot 2^{-5t/4}$$

Divide both sides by $\frac{-7}{3}$.

$$\frac{29 \cdot 3}{7} = 2^{-5t/4}$$

Take log, base 2, of both sides.

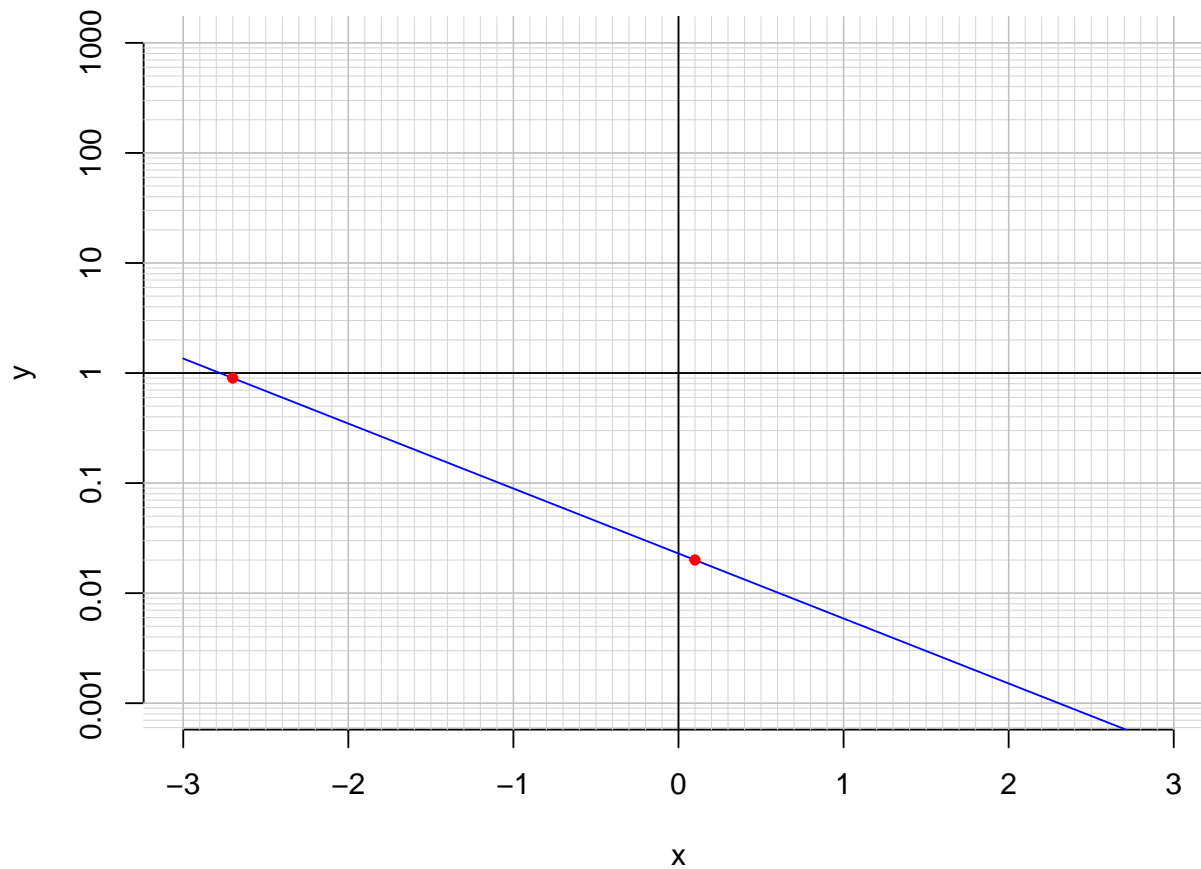$$\log_2\left(\frac{29 \cdot 3}{7}\right) = \frac{-5t}{4}$$

Divide both sides by $\frac{-5}{4}$.

$$\frac{-4}{5} \cdot \log_2\left(\frac{29 \cdot 3}{7}\right) = t$$

Switch sides.

$$t = \frac{-4}{5} \cdot \log_2\left(\frac{29 \cdot 3}{7}\right)$$

3. An exponential function $f(x) = 0.0229 \cdot e^{-1.36x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(0.1)$.

$$f(0.1) = 0.02$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{1.36} \cdot \ln\left(\frac{x}{0.0229}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.9)$.

$$f^{-1}(0.9) = -2.7$$